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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,131	08/31/2001	Julian Norley	P-1048	9247

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EXAMINER

BAHTA, ABRAHAM

ART UNIT	PAPER NUMBER
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1775

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DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,131

Applicant(s)

NORLEY ET AL.

Examiner

Abraham Bahta

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION

Specification

On page 2 , line 7 the specification cites an incorrect patent number. Correction is requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Shane et al (USP 3,404,061).

Shane teaches a laminated graphite sheet in which the sheet of material may be impregnated with various amounts of polymeric material such as an epoxy resin. See col. 14; line - col. 15, line 11 and col. 13, lines 59-66. The graphite material may be compressed at elevated temperature of up to 1000 °C. See col. 11, lines 22-40. Further, a heat curable impregnant or binder such as phenolic resin may be utilized. See col. 13, lines 66-74.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shane '061.

As discussed above, Shane teaches applicant's claimed invention except a pressure of from 1000 psi to 5000 psi; however, the reference at col. 4, lines 60-62 suggests the density and thickness of the sheet material can be varied by controlling the degree of compression.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the desired pressure and temperature to the graphite sheet material of Shane in order to obtain the desired thickness and density as taught by Shane.

Claim Rejections - 35 USC § 102

Claims 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Shane et al '061.

Shane teaches a laminated graphite sheet in which the sheet of material may be impregnated with various amounts of polymeric material such as an epoxy resin. See col. 14, line - col. 15, line 11 and col. 13, lines 59-66. The graphite material may be compressed at elevated temperature of up to 1000°C. See col. 11, lines 22-40. Further, Shane teaches the laminated graphite sheet may include non-graphite materials such as aluminum and copper. See col. 5, lines

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7-16. Further, a heat curable impregnant or binder such as phenolic resin may be utilized. See col. 13, lines 66-74.

Claim Rejections - 35 USC § 103

Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shane '061.

As discussed above, Shane teaches applicant's claimed invention except the specific temperature of below 200°C and a pressure of below about 5000 psi; however, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to vary the temperature and pressure in order to achieve a flexible graphite sheet material having the desired surface properties.

Claim Rejections - 35 USC § 102

Claims 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Shane et al '061.

Shane teaches a laminated graphite sheet in which the sheet of material may be impregnated with various amounts of polymeric material such as an epoxy resin. See col. 14, line - col. 15, line 11 and col. 13, lines 59-66. The graphite material may be compressed at elevated temperature of up to 1000°C. See col. 11, lines 22-40. Further, Shane teaches the laminated graphite sheet may include non-graphite materials such as aluminum and copper. See col. 5, lines 7-16. Further, a heat curable impregnant or binder such as phenolic resin may be utilized. See col. 13, lines 66-74. In addition, the reference teaches the graphite sheet material may possess or exhibit

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thermal conductivity, thermal insulating properties and anisotropic electrical properties. See col. 13, lines 16-26.

Claim Rejections - 35 USC § 103

Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shane et al '061.

As discussed above, Shane teaches applicant's claimed invention expect the specific a pressure of 1000 to 5000 psi; however, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to vary the temperature and pressure depending on ultimate use of the product.

Regarding claims 12-13, Shane does not require a thermal conductivity greater than 100 W/mC; however, Shane teaches the thermal conductivity of the graphite sheet material in "a" direction may be in the range of 140-150 Btu. See col. 13, lines 16-24. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the curing temperature and pressure in order to achieve the desired thermal conductivity, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art.

Regarding claim 14, the reference at col. 4, lines 60-62 suggests the density and thickness of the sheet material can be varied by controlling the degree of compression.

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It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the desired pressure to the graphite sheet of material in order to obtain the desired thickness and density as taught by Shane.

Regarding claim 15-16, the reference does not require a resin content of 3% to about 5% by weight; however, the reference at col. 10, lines 23-27 suggests the graphite sheet of material may be impregnated with suitable impregnant or additives such as epoxy resin. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the desired content of a resin in order to modify the nature or properties of the graphite sheet material depending on the final use of the product.

Claim Rejections - 35 USC § 103

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shane et al '061.

Shane teaches a resin impregnated flexible graphite sheet material wherein the sheet of material possesses anisotropic electrical, thermal insulating and thermal conductivity properties. See col. 13, lines 16-30. The resin may be epoxy resin. See col., lines 56-74.

Shane does not require thermal conductivity of greater than about 300 W/mC and a thermal conductivity of less than about 10 W/mC in an in plane direction and in an out of plane direction respectively; however, Shane in several embodiments suggests the graphite sheet material may be modified to achieve the desired properties of the material. For example, Shane discloses the density and thickness of the sheet material can be varied by controlling the degree of

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compression (col. 4, lines 6-62); the degree of anisotropy may be increased with increasing density (col. 4, lines 66-69); impregnants or additives such as metal powder, clay, organic polymeric materials and the like can be incorporated or mixed with the graphite composition to form the desired sheet material (col. 5, lines 1-6); the temperature in which the graphite material is cured may be varied to modify the graphite sheet material (col. 11, lines 22-26) and the graphite sheet material may be modified to possess either low or high thermal conductivity (col. 13, lines 9-10).

Given the above teaching, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the graphite sheet material to possess the desired thermal conductivity depending on the ultimate use of the product.

Regarding claim 19, the reference at col. 4, lines 60-62 suggests the density and thickness of the sheet material can be varied by controlling the degree of compression.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to employ the desired pressure to the graphite sheet of material in order to obtain the desired thickness and density as taught by Shane.

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Any inquiry concerning this communication should be directed to Abraham Bahta at telephone number (703) 308-4412. The Examiner can normally be reached Monday-Friday from 11:30 AM -8:00 PM (EST).

If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor Deborah, Jones, can be reached on (703) 308-3822.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.



A. Bahta

10/03/02



DEBORAH JONES
SUPERVISORY PATENT EXAMINER